

Things to Know, Understand, and Do

Chapters 1 & 2: Chemical Foundations; Atoms, Molecules, and Ions

By the end of Chapters 1&2, you should

know how to...
1. Recognize the different states of matter (<i>solid, liquid</i> and <i>gas</i>) and give their characteristics.
2. Appreciate the difference between <i>pure substances</i> and <i>mixtures</i> and the difference between <i>homogeneous</i> and <i>heterogeneous mixtures</i> .
3. Recognize the importance of representing matter at the macroscopic level and at the particulate level.
4. Identify the name or symbol for an element, given its symbol or name.
5. Use the terms <i>atom, element, molecule, and compound</i> correctly.
6. List commonly used physical properties of matter.
7. Identify several physical properties of common substances.
8. Use <i>density</i> to connect the volume and mass if a substance.
9. Calculate the volume of mass of a substance, given the density of the substance and either its volume or mass.
10. Explain the difference between <i>chemical</i> and <i>physical</i> changes and give examples of them.
11. Convert between temperatures on the Celsius and Kelvin scales.
12. Use <i>dimensional analysis</i> to carry out unit conversions.
13. Explain the historical development of the atomic theory and identify some of the scientists who made important contributions
14. Describe <i>electrons, protons, and neutrons</i> and the general structure of the atom.
15. Define <i>isotope</i> and give the mass number and number of neutrons for a specific isotope.
16. Identify the periodic table locations of <i>groups, periods, metals, metalloids, nonmetals, alkali metals, alkaline earth metals, halogens, noble gases, and the transition elements</i> .
17. Recognize similarities and differences in the properties of the common elements in a group.
18. Recognize and interpret molecular formulas, condensed formulas, and structural formulas.
19. Recognize that metal ions commonly lose one or more electrons to form cation (positive ions) and nonmetal atoms often gain electrons to form negative ions (anions).
20. Recognize that the charge on a metal cation in Groups IA, IIA, and IIIA is equal to the group number in which the element is found in the periodic table (M^{n+} , n =Group Number). Charges on transition metals are often +2 or +3.
21. Recognize that the negative charge on a single atom or monatomic anion, X^{n-} , is given by $n = 8$ -group number.
22. Give the names or formulas of polyatomic ions from memory , being given their formulas or names, respectively.
23. Name ionic compounds and simple binary covalent compounds (made only of nonmetal elements.)
understand...
24. The difference between <i>extensive</i> and <i>intensive</i> properties and give examples of them.
25. The difference between <i>precision</i> and <i>accuracy</i> and how to calculate <i>percent error</i> .
26. The correct use of <i>significant figures</i> in calculations.
27. The relative mass scale and the atomic mass unit (amu).
28. The major defining experiments, data analysis and conclusions.
29. The difference between ionic and covalent compounds.

Ch 2 HMWK

- p 69 Q 2, 4, 11
- p 70 Q 18, 22, 26, 27, 34
- p 71 Q 44, 46, 47, 51
- p 72 Q 53, 56, 58, 59, 64, 65
- p 73 Q 69, 78

In Class Presentation

- p 70 Q 30, 31